

Claims

1. A method for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL in a sample, the method comprising determining the expression level of markers selected from the markers identifiable by their Affymetrix Identification Numbers (affy id) as defined in Tables 1 and/or 2,

wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.1 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.1 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.2 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.2 having a positive fc value,

is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.3 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.3 having a positive fc value,

is indicative for the presence ALL_T lineage when ALL_T lineage is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.4 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.4 having a positive fc value,

5 is indicative for the presence ALL_t(8;14) when ALL_t(8;14) is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.5 having a negative fc value, and/or

10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.5 having a positive fc value,

is indicative for the presence AML_MLL when AML_MLL is distinguished from all other subtypes,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.6 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.6 having a positive fc value,

20 is indicative for the presence AML_inv(16) when AML_inv(16) is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.7 having a negative fc value, and/or

25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.7 having a positive fc value,

is indicative for the presence AML_inv(3) when AML_inv(3) is distinguished from all other subtypes,

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.8 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.8 having a positive fc value,

is indicative for the presence AML_komplext when AML_komplext is distinguished from all other subtypes,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.9 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.9 having a positive fc value,

10 is indicative for the presence AML_t(15;17) when AML_t(15;17) is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.10 having a negative fc value, and/or

15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.10 having a positive fc value,

is indicative for the presence AML_t(8;21) when AML_t(8;21) is distinguished from all other subtypes,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.11 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.11 having a positive fc value,

25 is indicative for the presence CLL when CLL is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.12 having a negative fc value, and/or

30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.12 having a positive fc value,

is indicative for the presence CML when CML is distinguished from all other subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.13 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 1.13 having a positive fc value,

is indicative for the presence normal-BM when normal-BM is distinguished from all leukemia subtypes,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.1 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.1 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from ALL_Ph+,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.2 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.2 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from ALL_T lineage,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.3 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.3 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from ALL_t(8;14),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.4 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.4 having a positive fc value,

5 is indicative for the presence ALL_MLL when ALL_MLL is distinguished from AML_MLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.5 having a negative fc value, and/or

10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.5 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from AML_inv(16),

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.6 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.6 having a positive fc value,

20 is indicative for the presence ALL_MLL when ALL_MLL is distinguished from AML_inv(3),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.7 having a negative fc value, and/or

25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.7 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from AML_komplex,

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.8 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.8 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from AML_t(15;17),

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.9 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.9 having a positive fc value,

10 is indicative for the presence ALL_MLL when ALL_MLL is distinguished from AML_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.10 having a negative fc value, and/or

15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.10 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from CLL,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.11 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.11 having a positive fc value,

25 is indicative for the presence ALL_MLL when ALL_MLL is distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.12 having a negative fc value, and/or

30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.12 having a positive fc value,

is indicative for the presence ALL_MLL when ALL_MLL is distinguished from normal-BM,

and/or wherein

5 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.13 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.13 having a positive fc value,
is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from ALL_T lineage,

10 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.14 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.14 having a positive fc value,
15 is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from ALL_t(8;14),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.15 having a negative fc value, and/or
20 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.15 having a positive fc value,
is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from AML_MLL,

and/or wherein

25 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.16 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.16 having a positive fc value,
is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from AML_inv(16),
30

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.17 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.17 having a positive fc value,
5 is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from AML_inv(3),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.18 having a negative fc value, and/or
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.18 having a positive fc value,
is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from AML_komplex, t,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.19 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.19 having a positive fc value,
is indicative for the presence ALL_Ph+ when ALL_Ph+ is
20 distinguished from AML_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.20 having a negative fc value, and/or
25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.20 having a positive fc value,
is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from AML_t(8;21),

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.21 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.21 having a positive fc value,
is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from CLL,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.22 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.22 having a positive fc value,

10 is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.23 having a negative fc value, and/or

15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.23 having a positive fc value,

is indicative for the presence ALL_Ph+ when ALL_Ph+ is distinguished from normal-BM,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.24 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.24 having a positive fc value,

25 is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from ALL_t(8;14),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.25 having a negative fc value, and/or

30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.25 having a positive fc value,

is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from AML_MLL,

and/or wherein

5 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.26 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.26 having a positive fc value, is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from AML_inv(16),

10 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.27 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.27 having a positive fc value, is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from AML_inv(3),

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.28 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.28 having a positive fc value, is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from AML_komplex,

and/or wherein

25 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.29 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.29 having a positive fc value, is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from AML_t(15;17),

30

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.30 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.30 having a positive fc value,
5 is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from AML_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.31 having a negative fc value, and/or
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.31 having a positive fc value,
is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from CLL,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.32 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.32 having a positive fc value,
is indicative for the presence ALL_T lineage when ALL_T lineage
20 distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.33 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least
25 one of the numbers 1 to 50 of Table 2.33 having a positive fc value,
is indicative for the presence ALL_T lineage when ALL_T lineage distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one
30 of the numbers 1 to 50 of Table 2.34 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.34 having a positive fc value,
is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from AML_MLL,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.35 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.35 having a positive fc value,

10 is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from AML_inv(16),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.36 having a negative fc value, and/or

15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.36 having a positive fc value,

is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from AML_inv(3),

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.37 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.37 having a positive fc value,

25 is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from AML_komplex,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.38 having a negative fc value, and/or

30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.38 having a positive fc value,

is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from AML_t(15;17),

and/or wherein

5 a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.39 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.39 having a positive fc value,
is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from AML_t(8;21),

10 and/or wherein

a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.40 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.40 having a positive fc value,
15 is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.41 having a negative fc value, and/or
20 a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.41 having a positive fc value,
is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
distinguished from CML,

and/or wherein

25 a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.42 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.42 having a positive fc value,
is indicative for the presence ALL_t(8;14) when ALL_t(8;14)
30 distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.43 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.43 having a positive fc value,
5 is indicative for the presence AML_MLL when AML_MLL distinguished from AML_inv(16),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.44 having a negative fc value, and/or
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.44 having a positive fc value,
is indicative for the presence AML_MLL when AML_MLL distinguished from AML_inv(3),

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.45 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.45 having a positive fc value,
is indicative for the presence AML_MLL when AML_MLL
20 distinguished from AML_komplex,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.46 having a negative fc value, and/or
25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.46 having a positive fc value,
is indicative for the presence AML_MLL when AML_MLL distinguished from AML_t(15;17),

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.47 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.47 having a positive fc value,
is indicative for the presence AML_MLL when AML_MLL distinguished from AML_t(8;21),

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.48 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.48 having a positive fc value,
10 is indicative for the presence AML_MLL when AML_MLL distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.49 having a negative fc value, and/or
15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.49 having a positive fc value,
is indicative for the presence AML_MLL when AML_MLL distinguished from CML,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.50 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.50 having a positive fc value,
is indicative for the presence AML_MLL when AML_MLL distinguished from normal-BM,
25

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.51 having a negative fc value, and/or
30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.51 having a positive fc value,

is indicative for the presence AML_inv(16) when AML_inv(16)
distinguished from AML_inv(3),

and/or wherein

5 a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.52 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.52 having a positive fc value,
is indicative for the presence AML_inv(16) when AML_inv(16)
distinguished from AML_komplex,

10 and/or wherein

a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.53 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.53 having a positive fc value,
15 is indicative for the presence AML_inv(16) when AML_inv(16)
distinguished from AML_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.54 having a negative fc value, and/or
20 a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.54 having a positive fc value,
is indicative for the presence AML_inv(16) when AML_inv(16)
distinguished from AML_t(8;21),

and/or wherein

25 a lower expression of at least one polynucleotide defined by at least one
of the numbers 1 to 50 of Table 2.55 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least
one of the numbers 1 to 50 of Table 2.55 having a positive fc value,
is indicative for the presence AML_inv(16) when AML_inv(16)
30 distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.56 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.56 having a positive fc value,
5 is indicative for the presence AML_inv(16) when AML_inv(16) distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.57 having a negative fc value, and/or
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.57 having a positive fc value,
is indicative for the presence AML_inv(16) when AML_inv(16) distinguished from normal-BM,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.58 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.58 having a positive fc value,
is indicative for the presence AML_inv(3) when AML_inv(3) distinguished from AML_komplext,
20

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.59 having a negative fc value, and/or
25 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.59 having a positive fc value,
is indicative for the presence AML_inv(3) when AML_inv(3) distinguished from AML_t(15;17),

and/or wherein

30 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.60 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.60 having a positive fc value,
is indicative for the presence AML_inv(3) when AML_inv(3) distinguished from AML_t(8;21),

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.61 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.61 having a positive fc value,

10 is indicative for the presence AML_inv(3) when AML_inv(3) distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.62 having a negative fc value, and/or

15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.62 having a positive fc value,

is indicative for the presence AML_inv(3) when AML_inv(3) distinguished from CML,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.63 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.63 having a positive fc value,

25 is indicative for the presence AML_inv(3) when AML_inv(3) distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.64 having a negative fc value, and/or

30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.64 having a positive fc value,

is indicative for the presence AML_komplext when AML_komplext distinguished from AML_t(15;17),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.65 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.65 having a positive fc value,

is indicative for the presence AML_komplext when AML_komplext distinguished from AML_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.66 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.66 having a positive fc value,

is indicative for the presence AML_komplext when AML_komplext distinguished from CLL,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.67 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.67 having a positive fc value,

is indicative for the presence AML_komplext when AML_komplext distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.68 having a negative fc value, and/or

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.68 having a positive fc value,

is indicative for the presence AML_komplext when AML_komplext distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.69 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.69 having a positive fc value,
5 is indicative for the presence AML_t(15;17) when AML_t(15;17) is distinguished from AML_t(8;21),

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.70 having a negative fc value, and/or
10 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.70 having a positive fc value,
is indicative for the presence AML_t(15;17) when AML_t(15;17) is distinguished from CLL,

and/or wherein

15 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.71 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.71 having a positive fc value,
is indicative for the presence AML_t(15;17) when AML_t(15;17) is distinguished from CML,
20

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.72 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.72 having a positive fc value,
25 is indicative for the presence AML_t(15;17) when AML_t(15;17) is distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.73 having a negative fc value, and/or
30

a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.73 having a positive fc value,
is indicative for the presence AML_t(8;21) when AML_t(8;21) is distinguished from CLL,

5 and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.74 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.74 having a positive fc value,
10 is indicative for the presence AML_t(8;21) when AML_t(8;21) is distinguished from CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.75 having a negative fc value, and/or
15 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.75 having a positive fc value,
is indicative for the presence AML_t(8;21) when AML_t(8;21) is distinguished from normal-BM,

and/or wherein

20 a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.76 having a negative fc value, and/or
a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.76 having a positive fc value,
is indicative for the presence CLL when CLL is distinguished from
25 CML,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.77 having a negative fc value, and/or
30 a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.77 having a positive fc value,

is indicative for the presence CLL when CLL is distinguished from normal-BM,

and/or wherein

a lower expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.78 having a negative fc value, and/or a higher expression of at least one polynucleotide defined by at least one of the numbers 1 to 50 of Table 2.78 having a positive fc value, is indicative for the presence CML when CML is distinguished from normal-BM.

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2. The method according to claim 1 wherein the polynucleotide is labelled.

3. The method according to claim 1 or 2, wherein the label is a luminescent, preferably a fluorescent label, an enzymatic or a radioactive label.

15

4. The method according at least one of the claims 1-3, wherein the expression level of at least two, preferably of at least ten, more preferably of at least 25, most preferably of 50 of the markers of at least one of the Tables 1.1-2.78 is determined.

20

5. The method according to at least one of the claims 1-4, wherein the expression level of markers expressed lower in a first subtype than in at least one second subtype, which differs from the first subtype, is at least 5 %, 10% or 20%, more preferred at least 50% or may even be 75% or 100%, i.e. 2-fold lower, preferably at least 10-fold, more preferably at least 50-fold, and most preferably at least 100-fold lower in the first subtype.

25

6. The method according to at least one of the claims 1-4, wherein the expression level of markers expressed higher in a first subtype than in at least one second subtype, which differs from the first subtype, is at least 5

30

%, 10% or 20%, more preferred at least 50% or may even be 75% or 100%, i.e. 2-fold higher, preferably at least 10-fold, more preferably at least 50-fold, and most preferably at least 100-fold higher in the first subtype.

- 5 7. The method according to at least one of the claims 1-6, wherein the sample is from an individual having leukemia.
8. The method according to at least one of the claims 1-7, wherein at least one polynucleotide is in the form of a transcribed polynucleotide, or a portion thereof.
- 10 9. The method according to claim 8, wherein the transcribed polynucleotide is a mRNA or a cDNA.
- 15 10. The method according to claim 8 or 9, wherein the determining of the expression level comprises hybridizing the transcribed polynucleotide to a complementary polynucleotide, or a portion thereof, under stringent hybridization conditions.
- 20 11. The method according to at least one of the claims 1-7, wherein at least one polynucleotide is in the form of a polypeptide, or a portion thereof.
12. The method according to claim 8, 9 or 12, wherein the determining of the expression level comprises contacting the polynucleotide or the polypeptide with a compound specifically binding to the polynucleotide or the polypeptide.
- 25 13. The method according to claim 12, wherein the compound is an antibody, or a fragment thereof.

14. The method according to at least one of the claims 1-13, wherein the method is carried out on an array.
15. The method according to at least one of the claims 1-14, wherein the method is carried out in a robotics system.
16. The method according to at least one of the claims 1-15, wherein the method is carried out using microfluidics.
17. Use of at least one marker as defined in at least one of the claims 1-3 for the manufacturing of a diagnostic for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL.
18. The use according to claim 17 for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL in an individual having leukemia.
19. A diagnostic kit containing at least one marker as defined in at least one of the claims 1-3 for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL, in combination with suitable auxiliaries.

20. The diagnostic kit according to claim 19, wherein the kit contains a reference for the leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK),
5 AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL.
- 10 21. The diagnostic kit according to claim 20, wherein the reference is a sample or a data bank.
22. An apparatus for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal
15 karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, normal-BM, and/or CLL in a sample containing a reference data bank.
- 20 23. The apparatus according to claim 22, wherein the reference data bank is obtainable by comprising
(a) compiling a gene expression profile of a patient sample by determining the expression level of at least one marker selected from the markers identifiable by their Affymetrix Identification
25 Numbers (affy id) as defined in Tables 1, and/or 2, and
(b) classifying the gene expression profile by means of a machine learning algorithm.
- 30 24. The apparatus according to claim 23, wherein the machine learning algorithm is selected from the group consisting of Weighted Voting, K-Nearest Neighbors, Decision Tree Induction, Support Vector Machines, and Feed-Forward Neural Networks, preferably Support Vector Machines.

25. The apparatus according to at least one of the claims 22-24, wherein the apparatus contains a control panel and/or a monitor.
- 5 26. A reference data bank for distinguishing leukemia subtypes t(15;17), t(8;21), inv(16), inv(3), complex aberrant karyotype (CA), AML-MLL, normal karyotype (NK), AML-other (trisomy 8, trisomy 11, trisomy 13, monosomy 7, del(5q), del(9q), t(6;9); del(20q) and del(12p) and trisomy 4), ALL-MLL, ALL-Ph+, ALL-t(8;14), T-ALL, other B-lineage (OBL), CML, 10 normal-BM, and/or CLL obtainable by comprising
- (a) compiling a gene expression profile of a patient sample by determining the expression level of at least one marker selected from the markers identifiable by their Affymetrix Identification Numbers (affy id) as defined in Tables 1, and/or 2, and
- 15 (b) classifying the gene expression profile by means of a machine learning algorithm.
27. The reference data bank according to claim 26, wherein the reference data bank is backed up and/or contained in a computational memory chip.